River Continuity Implementation Projects

Riverways works with municipalities to implement on-the ground demonstration projects to retrofit, replace, or modify barriers to fish and wildlife movement. Riverways provides technical assistance to volunteer groups and municipalities to ensure that the demonstration projects reflect sound engineering and river geomorphology principles and meet regulatory requirements

Options to consider for restoration can include:

- removing barriers
- replacing ineffective culverts
- building step-pool systems with rock weirs downstream of culverts to reconnect the stream through a barrier
- installing baffles in culverts to slow flow velocities and increase water depth
- removing pipe culverts and replacing them with bridges or bottomless arch culverts.

Several stream crossing restoration projects are in progress in Massachusetts. In western Massachusetts particular attention has been paid to otherwise high-quality brook trout and Atlantic salmon streams. As more projects are identified, Riverways will move forward with crossing retrofits and replacements.

Bronson Brook, Worthington
Replacement of a failed double-box culvert on Bronson Brook, in the Westfield, will eliminate culvert perching and improve flood protection for local property owners and municipal infrastructure. Slumped gabion baskets downstream could also be redesigned for better stream management.

Tower Brook, Chesterfield
On Tower Brook in the Westfield River Watershed the retrofit of a perched, high velocity flow culvert will include raising the tail-water pool and installing baffle structures and rock inside the culvert to eliminate perching and match flow velocities and substrate of the natural stream.

Labor In Vain Brook, Somerset
Installation of a larger culvert on a small stream in southeastern Massachusetts, Labor in Vain Brook, will remove a tidal restriction and allow for increased flushing and improve a small salt marsh by naturally abating invasive species.

Labor in Vain Brook, downstream of culvert.

Labor in Vain Brook, upstream of undersized culvert.

Riverways Program, Mass. Dept of Fish and Game
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River Continuity: *Reconnecting River Habitat*

Massachusetts Riverways Program, Dept. of Fish and Game

What is River Continuity?

As long and linear systems, rivers and streams are particularly vulnerable to fragmentation. The construction of dams, roads, and railways can significantly disrupt the continuity of fish and wildlife habitats. Culverts and bridges can become barriers to fish and wildlife passage where flow depths are low or velocities are artificially high, openings are small, embankments are high and steep, or the downstream end of a culvert pipe is "perched" above the stream bottom. Such habitat fragmentation can have a significant impact on fish and wildlife populations. While the impacts of habitat fragmentation are significant, the problem has not yet reached mainstream awareness among transportation planners, road crews, and conservation groups.

Culvert problems can include low flow, outlet drop (perching) and high velocity, which impair habitat and movement for fish and wildlife.

The River Continuity Partnership (a collaborative effort with University of Massachusetts–Extension, Riverways and others) is:

- Developing stream crossing standards
- Training volunteer to complete stream crossing surveys
- Implementing demonstration projects at ineffective crossings
- Providing technical assistance to remediate problems
- Developing a guidance document to educate communities about stream crossing issues.

Volunteer Surveys

Local advocates and volunteers complete surveys of stream crossings which are then evaluated and prioritized to consider important habitat corridors and needs of particular species. Priority areas will be targeted for road crossing retrofits or replacements.

In the past two years, volunteer groups have surveyed more than 1,000 road crossings – mostly in the Westfield, Housatonic, Millers, Deerfield and Taunton watersheds.

Developing Standards

The River Continuity Partnership has developed standards for new stream crossings and recommendations for The standards consider:

- Crossing size (fish, wildlife, and water)
- Flow depth and velocity (simulate surrounding stream)
- Bed material (simulate surrounding stream)

Guidance Document

Riverways is developing an informational poster and booklet to highlight the importance of properly designed and maintained culverts and bridges for fish and wildlife passage. The guidance document will be mailed to conservation commissions and highway departments in Massachusetts.

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